

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-263039

(43)Date of publication of application : 26.09.2000

(51)Int.Cl.

C02F 1/28
B02C 19/18

(21)Application number : 11-111253

(71)Applicant : NIPPON SOLID CO LTD

(22)Date of filing : 16.03.1999

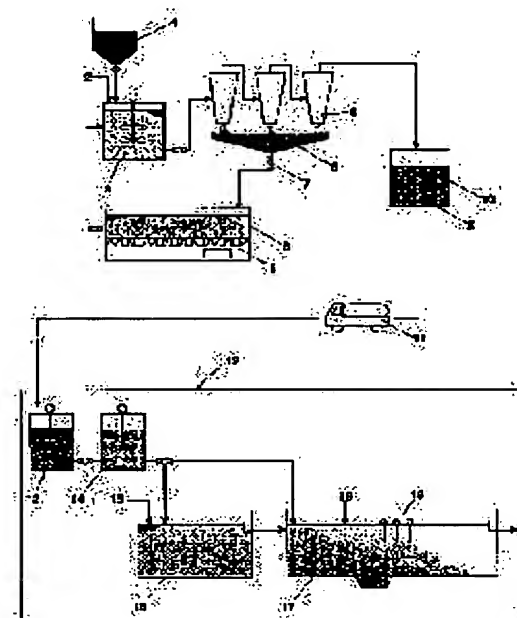
(72)Inventor : HATANO HITOSHI

(54) FINE PARTICLE-SUSPENDED LIQUID AND METHOD FOR TREATING DIRTY WATER

(57)Abstract:

PROBLEM TO BE SOLVED: To improve clarification by a method in which the effects of active carbon particles are demonstrated, the addition of a special apparatus, and like, to an existing apparatus is unnecessary, taking-in is easy, multi-point injection can be done and to use active carbon effectively.

SOLUTION: Active carbon is crushed by ultrasonic waves into particles 10-20 μm in average particle size, and the particles are mixed with liquid such as water 2, the mixture is agitated, and a suspension 10 of 5-30% fine particle content is obtained. In a method for treating dirty water, the suspension 10 is used in at least one place in a dirty water treatment process.



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CLAIMS

[Claim(s)]

[Claim 1] Particle suspension which crushes activated carbon in a liquid with a supersonic wave to the mean particle diameter of 10 microns thru/or 20 microns or less, and carries out mixed stirring with liquids, such as water, and it comes to generate.

[Claim 2] The corruption water treatment approach characterized by using particle suspension according to claim 1 by at least one or more places in a corruption water treatment process.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the new operation of the activated carbon used for water treatment etc.

[0002]

[Description of the Prior Art] When using activated carbon conventionally, it is bad, and it cannot be easy to become insoluble bad, and ***** cannot flow down, while the exposure effect has been low, and workability, such as fine particles and scattering of dust, cannot obtain original effectiveness with the thing of extent beforehand soaked in the liquid be [they / fine particles / continue] in many cases. Consequently, it is the actual condition of using the activated carbon of a large quantity. Furthermore, it precipitates for piping etc., the bridge phenomenon by plugging etc. also tends to occur, and it has been a problem. Moreover, there is no crushing validity in stirring by the machine in the object which prevents sedimentation in a tub, and it is expected the improvement.

[0003]

[Problem(s) to be Solved by the Invention] this invention person came to complete this invention, as a result of coming examination in piles variously about the approach that activated carbon can be used more effectively and easily.

[0004]

[Means for Solving the Problem] This invention activated carbon with a supersonic wave namely, to the mean particle diameter of 10 microns thru/or 20 microns or less Crush in a liquid, and are the particle suspension which dilutes to 5% thru/or about 30%, and carries out mixed stirring with liquids, such as water, and it comes to generate, and this particle suspension is further set at a corruption water treatment process. It is the corruption water treatment approach characterized by using by at least one or more places, and makes it possible to obtain the original effectiveness which an activated carbon particle has by this.

[0005] Next, although this invention is explained referring to a drawing, this invention is not limited to the following explanation.

[0006] Drawing 1 is the sectional view having shown an example at the time of using the particle suspension production process and this particle suspension in this invention for an established water purification treatment facility. Activated carbon 1 is stirred by ***** 3 with a dilution water 2, and classifies activated carbon after that with the centrifugal separators 4, such as a cyclone formed in multistage, and an object smaller than the grain size for which it asks is sent to ***** 5 as it is. On the other hand, the activated carbon with a large grain size collects on the undershirt blow section 6, carries out underwater crushing of the activated carbon in a liquid with a sonicator 9 in slurry pump 7 grade at ultrasonic crushing ***** 8, processes it by continuation or the batch (batch operation), is returned to ***** 3, and performs same processing. Henceforth, it classifies according to centrifugal separation, and the object with a large grain size will be further crushed with a supersonic wave, will repeat processing, and will collect to a reservoir 5 eventually.

[0007] The particle suspension 10 furthermore brought together in the reservoir 5 is carried into the established water purification treatment facility 12 in Raleigh vehicle 11 grade. Under the present circumstances, when the particle suspension 10 is carried as high concentration particle suspension with deep liquid concentration, it is efficient. By the mixed agitator 13, within the established water purification treatment facility 12, the particle suspension 10 is diluted after mixed stirring, is diluted with the dilution tub 14 to 5% thru/or about 30%, and with raw water 15, an activated carbon reaction is used by the reaction vessel 16, it uses a flocculant 18 and stream ramp 19 grade with a lifting and a settling tank 17, precipitation

of an affix and activated carbon is performed, and clarified water is emitted.

[0008] In the corruption water treatment approach using the particle suspension in this invention, turbidity reduction of the corruption to process for every process can be efficiently carried out in the down stream processing by performing impregnation by two or more places, as it not only pours in particle suspension, but one place shows to drawing 1 . For example, particle suspension is poured in in early stages of corruption down stream processing, easy corruption of turbidity reduction is processed comparatively, and after that, according to the clarification situation of cloudy water, by pouring in in other parts of a process, whenever it passes through a process, the turbidity reduction of the corruption which was not able to carry out turbidity reduction in impregnation once can be carried out gradually, and utilization with the sufficient effectiveness of activated carbon is attained.

[0009] What is necessary is just to adjust the concentration of the particle suspension in this invention to 5% thru/or about 30% of concentration suitably according to a situation, although about 10% is considered to be general.

[0010] By grinding using a sonicator, since the purge (exfoliation separation) of the air bubbles which the surface area of the grand total becomes large, and adhere to the front face by oscillation within equipment [activated carbon] is also performed early, effectiveness effectiveness goes up this invention substantially. Moreover, since it excels in floating [in the inside of a liquid] by detailed crushing and sedimentation becomes slow, contact time with a liquid is long and can attain the original object by little activated carbon.

[0011] Moreover, what is necessary is to use the mixer which each water purification treatment facility has attached even if handling is easy since stirring mixing of the activated carbon with the detailed particle suspension in this invention is carried out at the dilution water, incorporation should be easily [for an established water purification treatment facility] possible and activated carbon should precipitate within particle suspension in the passage of time, and just to stir.

[0012] It is difficult to correspond and to process harmful matter which poses a problem these days, such as dioxin and heavy metal which are the detailed new pollutants various [with pollutants] in raw water, and environmental hormone, with the conventional established facility, and highly advanced processing is attained by carrying out long duration contact of the various effectiveness by activated carbon by this invention.

[0013]

[Effect of the Invention] As mentioned above, it is easy to incorporate for it not to be necessary for the effectiveness effectiveness of activated carbon not only to go up by using the particle suspension in this invention, but to **** special equipment etc. to an established facility etc., and it is the corruption water treatment approach aiming at obtaining the original effectiveness which the deployment of of efficient turbidity reduction and activated carbon is attain, and an activated carbon particle has by performing multipoint impregnation.

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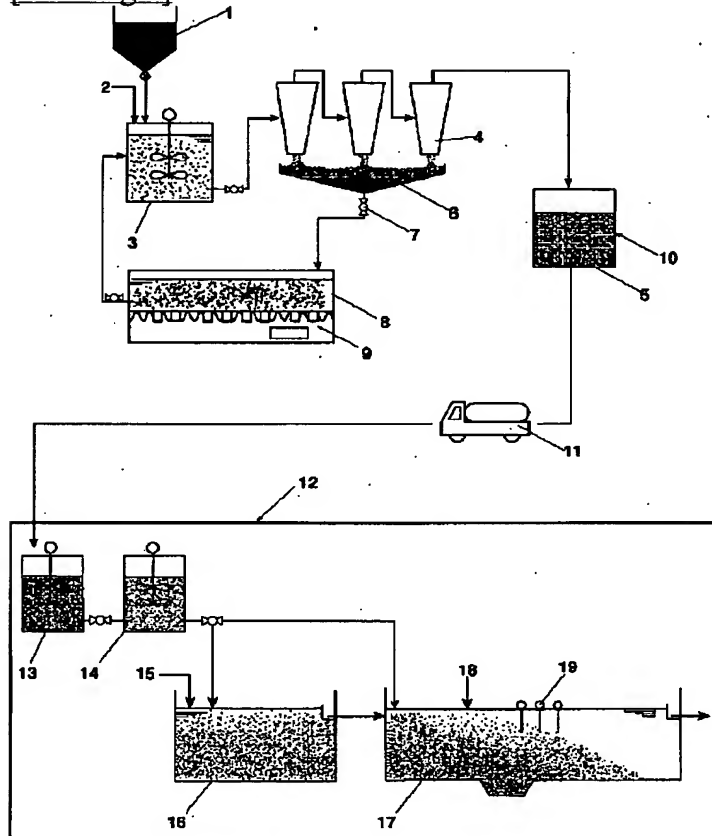
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DRAWINGS

[Drawing 1]



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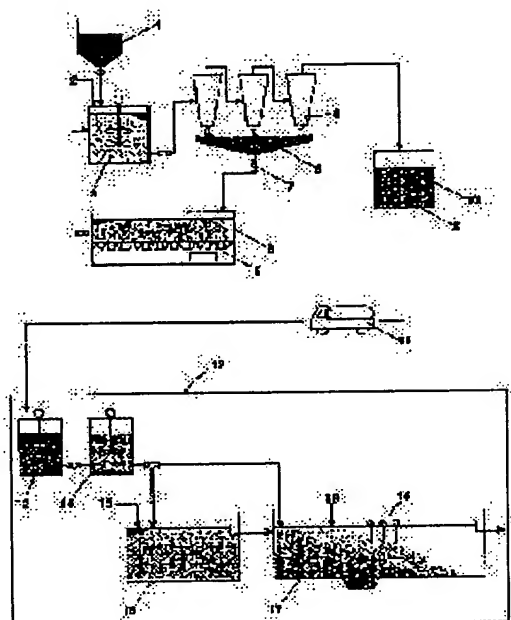
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[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号
特開2000-263039
(P2000-263039A)

(43)公開日 平成12年9月26日(2000.9.26)

(51)Int.Cl. ⁷	識別記号	F I	テームコード(参考)
C 0 2 F 1/28		C 0 2 F 1/28	D 4 D 0 2 4
B 0 2 C 19/18		B 0 2 C 19/18	B 4 D 0 6 7

審査請求 未請求 請求項の数2 書面 (全 3 頁)

(21)出願番号 特願平11-111253

(22)出願日 平成11年3月16日(1999.3.16)

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Fターム(参考) 4D024 BA02 BB01 BC04

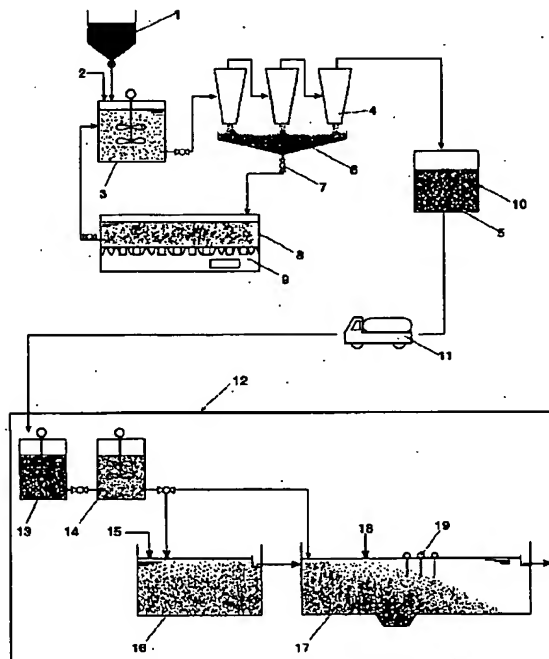
4D067 CE01 GA20

(54)【発明の名称】 微粒子懸濁液体及び汚濁水処理方法

(57)【要約】

【目的】本発明は、活性炭粒子の持つ本来の効果をあげることを目的とした汚濁水処理方法であり、既施設に特殊な装置等を加設する必要がない等、取り込みが容易で、多点注入を行なうことにより、さらに効率のよい除濁と活性炭の有効利用を目的とする。

【構成】活性炭を超音波にて平均粒子径10ミクロン乃至20ミクロン以下に破碎し、水等の液体により5%乃至30%程度に希釈、混合攪拌し生成してなる微粒子懸濁液であり、さらには本微粒子懸濁液を汚濁水処理工程において、少なくとも1箇所以上で用いることを特徴とした汚濁水処理方法である。



【特許請求の範囲】

【請求項1】活性炭を超音波により平均粒子径10ミクロン乃至20ミクロン以下に液体中で破碎し、水等の液体と混合攪拌し生成してなる、微粒子懸濁液。

【請求項2】請求項1記載の微粒子懸濁液を、汚濁水処理工程において、少なくとも1箇所以上で用いることを特徴とした汚濁水処理方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、水処理などに利用される活性炭の新しい使用方法に関する。

【0002】

【従来の技術】従来、活性炭を使用する場合、粉体や粉塵の飛散等作業性が悪く、粉体のままやあらかじめ液体で濡らした程度のものでは、水濡れが悪くママコになり易く、接触効果が低いまま流下して、本来の効果をあげることができないことが多い。その結果、大量の活性炭を利用している現状である。さらに配管などに沈着してしまい、詰まり等によるブリッジ現象も生じ易く、問題となっている。また、槽内沈降を防止する目的での機械による攪拌には、破碎効力はなく、改善が望まれている。

【0003】

【発明が解決しようとする課題】本発明者は、活性炭をより効果的、かつ容易に利用できる方法について種々検討を重ねてきた結果、本発明を完成するに至った。

【0004】

【課題を解決するための手段】すなわち本発明は、活性炭を超音波により平均粒子径10ミクロン乃至20ミクロン以下に、液体中で破碎し、水等の液体により5%乃至30%程度に希釈、混合攪拌し生成してなる微粒子懸濁液であり、さらには本微粒子懸濁液を汚濁水処理工程において、少なくとも1箇所以上で用いることを特徴とした汚濁水処理方法であり、これにより活性炭粒子の持つ本来の効果をあげることを可能としたものである。

【0005】次に本発明を図面を参照しながら説明するが、本発明は以下の説明に限定されるものではない。

【0006】図1は、本発明における微粒子懸濁液製造工程及び、本微粒子懸濁液を、既設浄水処理施設に利用した場合の一例を示した断面図である。活性炭1は希釈水2と共に溶解槽3で攪拌され、その後、多段に設けられたサイクロン等の遠心分離装置4により活性炭を分級し、所望する粒度より小さい物はそのまま貯溜槽5に送られる。一方、粒度の大きい活性炭は、アンダーブロー部6に溜り、スラリーポンプ7等で超音波破碎処理槽8で超音波発生装置9で液体中の活性炭を水中破碎し、連続、または回分（バッチ操作）で処理し、溶解槽3へ戻し、同様の処理を行なう。以降、遠心分離により分級し、粒度の大きい物はさらに超音波により破碎し処理を繰り返してゆき、最終的には貯溜槽5へ溜まることとな

る。

【0007】さらに貯溜槽5に集められた微粒子懸濁液10はローリー車11等で既設浄水処理施設12に持ち込まれる。この際、微粒子懸濁液10は、液体濃度の濃い、高濃度微粒子懸濁液として運搬すると効率がよい。既設浄水処理施設12内で、微粒子懸濁液10は、混合攪拌機13により混合攪拌後、希釈槽14で5%乃至30%程度に希釈され、原水15と共に反応槽16で活性炭反応を起こし、沈着槽17で凝集剤18や水流傾斜板19等を利用し、付着物および活性炭の沈着を行ない、清澄水を放出する。

【0008】本発明における微粒子懸濁液を用いた汚濁水処理方法においては、その処理工程において、1箇所で微粒子懸濁液を注入するだけでなく、図1に示すように複数箇所での注入を行なうことにより、各過程ごとに処理したい汚濁を、効率よく除濁することができる。例えば、微粒子懸濁液を、汚濁処理工程の初期に注入して比較的除濁の容易な汚濁を処理し、その後濁水の浄化状況により、工程の他の箇所で注入してゆくことで、一度の注入では除濁出来なかった汚濁を、工程を経るごとに徐々に除濁でき、活性炭の効率のよい利用が可能となる。

【0009】本発明における微粒子懸濁液の濃度は、10%程度が一般的と考えられるが、状況に応じ、5%乃至30%程度の濃度に適宜調整すればよい。

【0010】本発明は、超音波発生装置を用いて粉碎することにより、活性炭が装置内で振動により、総計の表面積が大きくなり、且つその表面に付着する気泡の追い出し（剥離分離）も早く行われるために効果効率が大幅に上がる。また微細破碎により液体中での浮遊性に優れ、沈降がおそくなるため、液体との接触時間が長く、少量の活性炭で本来の目的を達成することができる。

【0011】また、本発明における微粒子懸濁液は、微細な活性炭が希釈水に攪拌混合されているため、取り扱いが容易で、既設浄水処理施設にも容易に取り込みが可能であり、万一経時と共に、微粒子懸濁液内で活性炭が沈着しても、各浄水処理施設が付設している混合機を利用し攪拌すればよい。

【0012】原水中の多岐にわたる微細新汚染物質である、ダイオキシンや重金属、環境ホルモン等、近來問題となっている有害物質を、旧来の既設設備で対応、処理することは困難であり、本発明によって、活性炭による多様な効果を長時間接触させることにより、高度化処理が可能となるものである。

【0013】

【発明の効果】以上、本発明における、微粒子懸濁液を用いることで、活性炭の効果効率が上がるのみならず、既設施設に特殊な装置等を加設する必要がない等、取り込みが容易で、多点注入を行なうことにより、効率のよい除濁と活性炭の有効利用が可能となり、活性炭粒子の

持つ本来の効果をあげることを目的とした汚濁水処理方法である。

【図面の簡単な説明】

【図1】本発明における微粒子懸濁液の製造工程及び、本微粒子懸濁液を既設浄水処理施設に利用した場合の断面図。

【符号の説明】

1. 活性炭
2. 希釈水
3. 溶解槽
4. 遠心分離装置
5. 貯溜槽
6. アンダーフロー部

- * 7. スラリーポンプ
8. 超音波処理槽
9. 超音波発生装置
10. 微粒子懸濁液
11. ローリー車
12. 既設浄水処理施設
13. 混合攪拌機
14. 希釈槽
15. 原水
- 10 16. 反応槽
17. 沈殿槽
18. 凝集剤
- * 19. 水流傾斜板

【図1】

